United Nations E/CN.17/2005/3

Economic and Social Council

Distr.: General
10 December 2004

Original: English

Commission on Sustainable Development
Thirteenth session
11-22 April 2005
Item 4 (b) of the provisional agenda*
Thematic cluster for the implementation cycle 2004-2005
policy session: sanitation

Sanitation: policy options and possible actions to expedite implementation

Report of the Secretary-General

Summary

The sanitation target contained in the Plan of Implementation of the World Summit on Sustainable Development (Johannesburg Plan of Implementation) represents a strong political commitment of national Governments to reduce significantly, with the support of the international community, the proportion of people who do not have access to basic sanitation. Sanitation is beginning to be recognized as a national development priority that needs to be supported by adequate policies and budgetary allocations. Essential investment in sanitary facilities and waste-water treatment, as well as support for capacity-building and technology transfer, is likely to require the mobilization of sizeable additional resources. The mobilization of additional resources is also important so that water and sewerage utilities are able to upgrade existing services and to extend them to unserved populations. Giving small-scale service providers easier access to credit and service contracts can contribute towards expanding coverage. Adoption of low-cost technology options allows expanded coverage to broad segments of society. Effective management of waste water and water quality concerns can be achieved through strengthened monitoring systems, regulatory mechanisms and enforcement capacities. Greater community involvement, particularly of women, in water and sanitation management can promote simple technology design for easy maintenance, facilitate cost recovery and help ensure equitable access. Research on and demonstration of different sanitation options, particularly those that treat nutrients as a resource to be reused, can assist communities in selecting designs appropriate to their culture.

* E/CN.17/2005/1.

04-64776 (E) 010205

Contents

		Paragraphs	Page
I.	Introduction	1–4	3
II.	Expanding access to sanitation	5–30	3
	A. Access in urban areas	10–22	4
	B. Access in rural areas	23–30	6
III.	Promoting sanitation and hygiene education	31–38	8
IV.	Waste-water treatment and reuse	39–46	10
V.	Strengthening monitoring systems	47–49	11
VI.	Meeting the financing requirements for sanitation	50–65	12
VII.	Moving ahead: towards a framework for action	66–74	14

I. Introduction

1. At its twelfth session, the Commission on Sustainable Development reviewed the state of implementation of the goals and targets in the thematic areas of human settlements, water and sanitation as contained in Agenda 21, the Programme for the Further Implementation of Agenda 21 and the Plan of Implementation of the World Summit on Sustainable Development (Johannesburg Plan of Implementation). The Commission identified constraints to, and continuing challenges for, the implementation of these goals, including the Plan's target on access to basic sanitation.

2. Building on the outcome of the twelfth session of the Commission, the present report presents policy options and possible actions to address the constraints and obstacles to making progress on implementing the goals and targets related to sanitation. Individual countries will need to assess for themselves which of the policy options and possible actions would help them advance implementation, based on their own specific conditions and needs. The report provides a point of departure for the discussions at the Intergovernmental Preparatory Meeting, the outcome of which will be considered by the Commission at its thirteenth session.

3. The present report is based on data and information drawn from various sources, including but not limited to national and regional information, the United Nations system and other international organizations, and major groups and networks. UN-Water,[1] the United Nations inter-agency coordinating mechanism responsible for following up the Summit and the Millennium Development Goals in the areas of water and sanitation, provided essential inputs to the report.

4. The present report should be read in conjunction with the other reports of the Secretary-General dealing with freshwater and human settlements, in view of the interlinkages which exist among these major themes and the cross-cutting issues which are common to them all.

II. Expanding access to sanitation

5. In 2004, the Joint Monitoring Programme for Water Supply and Sanitation[2] issued a review of progress in meeting the access targets in water and sanitation. The update indicates that, from 1990 to 2002, global sanitation coverage rose from 49 per cent to 58 per cent of the world's population, with over 1.0 billion people gaining access during the period. Despite such progress, there were still over 2.6 billion people who lacked access to improved sanitation. The previous estimate was 2.4 billion. To meet the target of halving the proportion of people without access by 2015, taking into account population growth, an additional 1.9 billion people will need to be served — 1 billion in urban areas and 900 million in rural areas.[3] If the 1990-2002 trend continues, however, the world will miss the sanitation target by more than 500 million people. Close to 2.4 billion people would still be without improved sanitation in 2015, almost as many as there are today.

6. The planning and provision of sanitation services are often hampered by inadequate policy integration at the national level. Successful sanitation programmes are generally found where sanitation is recognized as a national development priority, with clear policies, budgets and coordination within Governments, notably among agencies responsible for water, health, environment,

education, finance and urban and rural development. Integration of sanitation into national sustainable development and poverty reduction strategies and integrated water resources management plans can promote improved sanitation, hygiene and health conditions. The rural environmental sanitation programme in Thailand that has been incorporated into the national economic and social development plans over the last 40 years,[4] the Ministry of Prevention, Public Hygiene and Sanitation of Senegal[5] as well as the "total sanitation campaigns" introduced in west Bengal[6] and specific locations in other South Asian countries provide good examples in that regard. Designating a specific institutional focus responsible for sanitation concerns at national level would allow for more coherent policy development, budgeting and implementation.

7. A rapid assessment of the current status and needs for sanitation and wastewater treatment in urban, peri-urban and rural areas can be carried out more easily where sanitation programmes and strategies are integrated into national priorities. Such assessments better facilitate the setting of appropriate benchmarks for meeting the commitments of the Johannesburg Plan of Implementation over the next 10 years. United Nations agencies or regional development banks can assist in conducting these rapid assessments.[7] Governance arrangements that incorporate ongoing monitoring and evaluation of access to and use of sanitation facilities can lead to more effective sanitation programmes by providing critical information to policy makers.

8. Sound decision-making and efficient allocation of resources for implementation of sanitation programmes can be enhanced by coordination with local authorities, community organizations and the private sector. Programmes that bring together all concerned institutions in a collaborative and coordinated fashion have been shown to have a higher chance of success. In sub-Saharan Africa, for example, the Ministerial Council on Water specifically noted that sanitation policies were crucial for their programmes to address the AIDS pandemic.[8]

9. Once the needs for sanitation are determined, different options in terms of costs and level of service can be considered and government efforts can be focused on the most cost-effective interventions that reach the largest number of people. Developing and testing low-cost solutions and concentrating on a few important but manageable sanitation challenges first (whether small and medium-sized towns, schools and/or public facilities) can yield early measurable improvements. Early improvements are helpful in building support for current and future policy options and programmes.

A. Access in urban areas

10. Since almost all future population growth will take place in the cities of the developing world, new sanitation approaches for urban areas are urgently needed. The situation is particularly serious in informal settlements, where coverage is extremely low and untreated human waste is contaminating the water supply and the environment, with severe impacts on human health.

11. On-site sanitation facilities, usually latrines, can be an important option for informal urban settlements in developing countries (see sect. II.B below on access in rural areas). Most of the relevant policies and programmes are applicable to both rural and urban areas unserved by sewers or other public facilities.

12. Where on-site solutions are not possible due to high population density or because of soil or groundwater conditions, large investments may have to be mobilized to cover conventional trunk sewers, feeder collection systems and wastewater treatment facilities. Municipal or national Governments generally have to carry the investment costs. However, estimates of the negative impact on public health and productivity resulting from the release of untreated sewage into the environment would seem to justify such investment.[9]

13. Public utilities most commonly build, operate and maintain urban sewer systems, while also providing water services. Accountable and efficient water and sanitation utilities are therefore key to service delivery. The quality of sanitation services can be enhanced and the useful lives of sanitation facilities extended by good operation and maintenance practices.

14. Utilities that consult with stakeholders, including the urban poor and residents of informal settlements, on key issues affecting community sanitation services will be better able to meet customers' water supply and sanitation needs, and are more likely to be able to collect fees to cover their costs. Local community involvement in sanitation planning and implementation allows for a fuller accounting of local conditions and preferences in selecting among technology and service options.

15. Governments may encourage municipalities and utilities to select lower-cost solutions than conventional sewer systems, such as condominial sewers, pioneered in Brazil, which use shallow feeder networks, with only one main sewer connection per block. A condominial system differs from conventional sewerage in that it relies heavily on user participation and can be introduced on a step-by-step or modular basis. While condominial sewerage does not conform to a hard set of technical standards, it fully incorporates the means and preferences of the target group in order to ensure the feasibility and sustainability of the system. Households pay lower connection fees and service rates because they contribute to the installation and maintenance of the system. The condominial system operator can recover a substantial portion of the initial investment in the short term from the connection fees, while cost recovery for the mains network can be obtained over the longer term from the water rates.[10] Users have a common interest in ensuring that the local system functions properly and in performing proper maintenance throughout.

16. As in Bangkok, urban sewer networks can be divided into several smaller systems serving different zones, each with its own collection and treatment. Each zone-level project is technically and managerially simpler than a city-wide project, and the smaller projects allow for a more affordable phased investment programme. However, these advantages would need to be weighed against the economies of scale of large plants.[11]

17. Policies and programmes to promote communal toilet facilities as an alternative to on-site latrines can improve sanitation in crowded public areas, such as markets or bus and train stations, as well as in densely crowded settlements. Well maintained community blocks provide the same health and environmental benefits as on-site facilities, assuming consistent use. A community toilet block programme in Mumbai, India, for example, is based on a partnership between the municipality and communities, in which the municipality provides the initial capital while community groups take full charge of operation and management. Communities recover costs through user charges designed to be affordable for all.[12]

18. An expansion in sanitation services within urban areas can be encouraged through the organization of participatory training on community-based management of water and sanitation schemes. Involving local communities directly in the operation and management of community toilet facilities has greatly expanded sanitation coverage in Addis Ababa, for example. An NGO-run programme assigns a group of families to manage a block of toilets, with each family responsible for maintaining its assigned latrine.[13] Community toilet blocks in Kano, Nigeria, have generated employment for private operators, who pay a small fee to operate public toilets and are responsible for collecting user fees, cleaning and maintaining the facilities.[14]

19. Ecological sanitation, with human wastes recovered for use as fertilizer, can be particularly cost-effective for urban communal facilities in areas where urban agriculture is widespread, provided that proper procedures for treating and using the fertilizer are followed to prevent the spread of disease. Ecological sanitation is being used in urban areas of China, South Africa, some northern European countries and elsewhere.[15]

20. In urban as well as rural areas, essential sanitation services are provided by small-scale service providers, often operating in the informal sector, who construct and maintain latrines, septic tanks and local sewerage connections, and install toilets and plumbing. Efforts can be made to encourage and assist small-scale providers to invest in improving and expanding their services, for example through the provision of microcredit, with repayment procedures tailored to their needs.[16] Microcredit schemes can also permit individual households to invest in on-site sanitation facilities as part of home improvements.

21. Assisting small-scale providers to become part of the formal sector can help them to gain readier access to credit and to plan for future expansion. Including them in the regulatory system can also improve the safety, performance and reliability of the systems they operate. Reducing administrative obstacles to small providers can also help. In Dar es Salaam, the city commission responsible for sanitation encouraged entrepreneurship and employment generation by deregulating pit-emptying services in an effort to improve public health after a cholera outbreak. After four years, competition among private operators had reduced the cost of the pit-emptying service by 50 per cent.[17]

22. Research on and practical demonstration of low-cost effective on-site sanitation technologies for use in urban and peri-urban areas have been effective in providing wider choices for urban dwellers in many African cities.

B. Access in rural areas

23. As serious as the situation is in urban areas, access to sanitation services in rural communities is even more problematic: only 31 per cent of rural inhabitants in developing regions (compared with 73 per cent of urban dwellers) are estimated to have access to any type of improved sanitation. Some 2 billion of the 2.6 billion people currently without access to improved sanitation live in rural areas.[18]

24. Implementing rural sanitation programmes can be a logistical challenge, particularly in ensuring availability of materials. One approach that has proven successful is for a government, through a specialized agency, to provide guidance

and support through ongoing technical assistance, ensuring availability of parts and services for maintenance at a sub-district level, and training local service providers in both technical and business matters. A cooperative approach that involves local authorities provides additional support. Local authorities are well situated to provide continuity and follow-up in maintaining sanitation facilities and services, promoting good hygiene practices and raising funds to support public facilities and on-site sanitation for low-income households.

25. In west Bengal, India, and elsewhere in South Asia, "total sanitation campaigns" involve a network of sanitation support facilities (rural sanitary marts and production centres) that supply hardware and supplementary services related to the provision, installation and maintenance of sanitation equipment. They also help to expand employment opportunities for masons and other craftspersons. Such facilities can be operated publicly and still provide opportunities for small-scale entrepreneurs and private businesses. In the case mentioned above, the facilities do not receive a subsidy and still make a small profit.[19]

26. Many rural sanitation programmes in developing countries concentrate on promoting and implementing on-site sanitation technologies which are culturally, economically and geographically appropriate. These generally depend on household investment in, and maintenance of, on-site facilities, most commonly latrines in low-income communities. The domed slab latrine, the ventilated improved pit (VIP) latrine, pour-flush toilets, composting toilets and ecological sanitation are examples of technologies or approaches that have been promoted and widely implemented, with varying degrees of success. Community engineers can be encouraged to develop local designs for all varieties of toilets, for use inside or outside the house, with plastic or thatched roofs, with concrete ring and slab or other locally available and affordable materials.[20]

27. Exchange of information and transfer of appropriate low-cost technologies and best practices in various countries can be promoted through technical training, simple manuals and capacity-building, with support from international and bilateral development agencies. Selection by the national sanitation agency, in consultation with other concerned organizations, of one or more standard designs for sanitation facilities can facilitate expansion of access. In Zimbabwe, the VIP latrine has been the sanitation technology of choice since the mid-1970s because it is clean, odour-free and cost-effective compared to ordinary latrines. More than 500,000 VIPs have been built in Zimbabwe over the last 25 years.[21] Lesotho increased sanitation coverage from 20 per cent in 1981 to 53 per cent in 2001 by promoting VIP latrines through community participation, education, private-sector involvement and builder training.[22] Many women were trained as latrine-builders and the additional income earned improved their status and contributed to poverty alleviation. In one region of the United Republic of Tanzania, technical training in latrine construction is provided to one person in each village, who constructs the slab for individual farmers, who in turn cultivate the latrine builder's fields under a barter arrangement.

28. In these and other cases, management is decentralized to the village level through village water or sanitation committees, which are often mandated to have a minimum representation of women. In one health district of Lesotho, the village water committee elects a "water minder", who is given the tools for the maintenance of the water system and the latrines. A maintenance fund is collected from villagers and administered by the water committee. Up to 90 per cent of the water minders

are women. Villagers tend to elect women because they have wide experience with water and sanitation, are often more readily available, and are most directly involved in matters of family health and hygiene.[23]

29. Ecological sanitation (ecosan) latrines may provide a valuable alternative to other types of on-site sanitation for the rural poor, particularly those living in arid regions or on unproductive land where fertilizer is needed. The nutrients derived from excreta can help increase the productivity of agricultural land and thus aid in poverty reduction. Many different types of trees and plants can be grown more quickly when sown on top of or close to a pit. Ecosan technologies have been successfully implemented recently in Mozambique and Zimbabwe.[24]

30. Given the slow rate of recent progress in extending rural sanitation in sub-Saharan Africa, a dramatic escalation of effort, accompanied by a deliberate commitment by donors to target the least developed countries, will be needed if this region is to meet the Johannesburg Plan of Implementation target. An example of such a commitment is the rural water supply and sanitation initiative of the African Development Bank, which aims to expand rural water and sanitation coverage in sub-Saharan Africa to 80 per cent by 2015. One promising option for rapid expansion of access would be a franchise-type approach on a massive scale, whereby a "mother" company would spawn many small franchises at the community level, similar to a programme in Indonesia. This could be carried out by NGOs and small service providers, supported by district offices that can provide training and technical support.

III. Promoting sanitation and hygiene education

31. Surveys have shown that, where households and communities are aware of the health and economic benefits of sanitation and hygiene, there is a greater willingness to pay for improved facilities and services and to alter hygiene behaviour.[25] Improved sanitation programmes are thus more likely to be successful where communities understand the benefits of good hygiene practices, such as regular hand-washing, and accept relevant technologies or products as appropriate to their culture.

32. Public awareness-raising programmes, designed in consultation with communities, require culturally sensitive health education for men and women, boys and girls. Consultations can involve national and local governments, public utilities, private service providers, NGOs, community associations, women's groups, educators and users of different types of sanitation services. Understanding the sanitation and hygiene concerns, preferences, practices, and ability and willingness to pay of both men and women can help in the design of cost-effective sanitation and hygiene facilities, services and campaigns,[26] avoiding under-used or badly maintained facilities and waste of scarce financial resources.

33. Civil society organizations could be encouraged to contribute to raising hygiene awareness. In Zimbabwe, for example, the NGO Applied Health Education and Development has promoted hygiene through the formation of voluntary community health clubs, which have shown significant results in terms of improved health knowledge and hygiene behaviour among club members.[27] In Bangladesh, the village education resource centre helps local people to understand the extent and impacts of environmental pollution in their own communities and then to construct

appropriate sanitation systems to solve the problem.[28] In Kerala, India, community-based socio-economic units have been implementing local water and sanitation projects since 1988 through community participation, from planning to monitoring.[29]

34. A focus on gender differences is of particular importance with regard to promoting hygiene education and sanitation facilities. Women play a crucial role in influencing the hygiene behaviour of young children, and men can also serve as role models in sustaining changes in habits. The success and effective use of water and sanitation facilities will depend on the involvement of both women and men in selecting the location and technology of such facilities.

35. The provision and maintenance of improved sanitation facilities in schools, along with hygiene education in school curricula, are important elements of hygiene campaigns.[30] A global pilot project including Burkina Faso, Colombia, Nicaragua, Nepal, Viet Nam and Zambia has provided limited funding for physical improvements in sanitation facilities in 10 to 20 schools per country, but it has helped catalyse resource mobilization for water and sanitation improvements in more than 11,000 schools. A pilot project in Malawi has evolved into a programme aiming to reach one quarter of the country's schools. In Ethiopia, NGOs, multilateral and bilateral development organizations have united around a common aim to improve water and sanitation in 60 per cent of the primary schools by 2007.[31]

36. Schools and children can be targeted for hygiene education campaigns because children and youth not only adopt new practices quickly but can also act as agents of behavioural and attitudinal change in their families. Latrines in schools and public places that are separated by sex provide privacy and dignity for girls and women. In Bangladesh, a school sanitation project with separate facilities for boys and girls has helped boost girls' school attendance by about 11 per cent per year on average from 1992 to 1999.[32]

37. Major international initiatives focusing on sanitation and hygiene have been important tools in some countries for national planning, policy-making, budgeting, and implementation of sanitation goals. The international participatory hygiene and sanitation transformation (PHAST) initiative enables communities to identify for themselves the main faecal-oral contamination routes of disease and how to block them. PHAST has been field tested in a number of African countries in both rural and urban settings.[33]

38. Successful high-profile international campaigns that focus on sanitation, such as the school sanitation and hygiene education[34] and the Water, Sanitation and Hygiene for All[35] campaigns, can support national efforts. Effective national campaigns, such as those in South Africa, India and Zimbabwe, can be used as models for other countries. Strong and clear messages from sanitation professionals, political leaders, popular celebrities, artists, schools and the media about the benefits of proper sanitation can help influence behaviour and mobilize public support for investments to improve sanitation. The United Nations "Water for Life" Decade (2005-2015) and the United Nations Decade of Education for Sustainable Development (2005-2014) offer opportunities to integrate sanitation and hygiene education with water supply in a major international effort to improve access to water supply and sanitation in all countries, in particular in developing countries.

IV. Waste-water treatment and reuse

39. The present report addresses domestic and municipal waste-water treatment and reuse. It does not deal with industrial waste water. Most of the domestic waste water generated in developing countries is discharged into the environment without treatment, contaminating downstream water supplies used for drinking water, irrigation, fisheries and recreational activities. Waste-water treatment and reuse is an issue primarily in urban areas with sewerage systems. In rural areas and urban areas with on-site sanitation facilities, such as latrines or septic tanks, waste water goes into the ground, where it is filtered and purified provided that the latrine or other disposal site is sufficiently far from sources of drinking water.

40. Waste-water treatment is a great challenge for developing countries because of its high costs and the technical skills required for operation and maintenance. Experience shows that waste-water treatment and reuse is more likely to be funded in national budgets if integrated with national integrated water resources management plans or with environmental policies. Some countries, such as Mexico,[36] Brazil, Chile and Costa Rica, are moving in this direction.

41. An increasing number of countries, particularly in water-scarce regions, are beginning to view waste water and sewage as a resource to be reused rather than as waste to be disposed of. With proper procedures, treated waste water can be reused in agriculture — although generally not directly on food crops — as well as for other uses. Reuse of treated urban waste water is widely practised in many countries. In Egypt, the Government has implemented a pilot project to grow timber in the desert by reusing waste water from nearby urban communities.[37] In Mauritius, the Government installed a series of sewer networks and waste-water treatment plants that allowed for the safe reuse of waste water for irrigation, mainly for sugar cane production.[38] In Mexico, waste water from a low-tech, low-cost treatment plant in Tijuana irrigates a large green area surrounding the facility, called Ecoparque, reducing the high level of untreated effluent that previously flowed into the Tijuana River.[39]

42. Detailed analyses of the options for waste-water management in the local context can be used to identify the most cost-effective solutions. There are a variety of technology options for waste-water treatment, ranging from simple, small-scale and inexpensive to large, complex and costly.[40] The choice will depend on population density, land use patterns, environmental conditions, climatic conditions, the preferences of the population and resources available. In high-density cities, large treatment plants are generally appropriate because they achieve substantial economies of scale, but they also require large investments.

43. Low-technology and low-cost waste-water treatment systems are most cost-effective in warm, humid climates where sufficient land is available for extensive natural or artificial waste-water treatment facilities. Such processes are generally slow and suitable for low volumes, relying on such natural elements as sunlight, heat, sedimentation, ultraviolet radiation and acidity to destroy pathogens, oxidize organic matter and remove other contaminants. In general, they are easier to operate and maintain than conventional waste-water treatment plants and do not require chemical inputs. They can be very low-cost solutions where inexpensive land is available but may be inefficient in hot, dry climates due to high evaporation.

44. Waste-water treatment and storage reservoirs offer the advantage of both treating the waste water and storing it until it is needed in the growing season or dry season. They generally include retention and treatment in an anaerobic pond before storage in the reservoir of usable water.

45. A relatively new technology using effective micro-organisms (EM) was developed in Japan and is now being used in a number of countries to increase the efficiency and effectiveness of waste-water treatment, either in large urban treatment plants or in constructed or natural low-tech treatment systems. EM utilizes a liquid mix of three types of naturally-occurring micro-organisms — lactic acid bacteria, yeasts and phototrophic bacteria — which create conditions to support each other and reduce harmful pathogens and other pollutants.[41]

46. In summary, a wide range of sanitation and waste-water treatment technology options is available, including:

(a) Sanitation systems that reduce waste water and pollution on-site through dry sanitation latrines or ecosan systems and more sophisticated closed-loop ecological sanitation alternatives, producing treated solid wastes and concentrated liquids for use as fertilizer;

(b) On-site or local waste-water treatment systems, including septic tanks and local mini-containers or tanks, discharging treated waste water into the soil or other ecosystems for further natural purification;

(c) Simple off-site treatment of waste water using the natural purification capacity of soil, vegetation and water bodies that hold the waste water long enough to allow solids to settle out and organic material to be oxidized;

(d) Simple artificial systems, such as constructed oxidation ponds, constructed wetlands, sand-filtration beds, bioremediation plants and aquaculture systems, designed to settle or filter out the solids and oxidize the organic materials;

(e) Urban sewer systems connected to large centralized waste-water treatment plants, including primary, secondary and tertiary treatment processes.[42]

V. Strengthening monitoring systems

47. Effective public policies and programmes to improve sanitation require accurate and up-to-date information on sanitation facilities, sanitation and hygiene practices and waste-water discharge. Monitoring and evaluation, where possible on a sampling basis and coordinated with monitoring of water supply and quality, should assess the convenience, reliability, sustainability and adequacy of sanitation services. Monitoring is also needed of the public health impacts of sanitation programmes, in particular of the impacts of new technologies and approaches compared with more traditional systems. Surveys of the willingness to pay for sanitation facilities and services are also important for determining charges and subsidies and for financial planning.

48. A sample survey approach can be cost-effective for assessing the impact of different sanitation investments on different segments of society (e.g., by gender and income groups). To promote participation in such efforts, collected data and analysis could be made conveniently available not only to government agencies and international organizations but also to NGOs, civic groups and the public at large.

49. The UNICEF/WHO joint monitoring programme methodology and data collection for estimating sanitation coverage could be strengthened and supported to provide better global, regional and national information to assess progress towards the World Summit on Sustainable Development target. National monitoring networks and data-collection capabilities could benefit from capacity-building that could also help achieve greater consistency with the Joint Monitoring Programme methodology. Governments could work together with water utilities, private companies, local authorities and community organizations to create, strengthen and maintain monitoring networks.[43]

VI. Meeting the financing requirements for sanitation

50. Estimates of the total cost of meeting the 2015 sanitation target in developing countries amount to an additional $10-20 billion per year, based on hygiene promotion and low-cost facilities.[44] Estimated investment requirements for wastewater treatment using conventional treatment plants are a multiple of that (over $50 billion), but wider use of simpler treatment methods would lower those costs.[45]

51. Public and private domestic capital is a principal source of finance for improved sanitation, although many challenges and problems remain in mobilizing such resources in poor countries. External finance can provide important additional resources for funding sanitation needs.

52. The economic, social and environmental benefits from improved sanitation and hygiene range from $3 to $34 per $1 invested, mainly as a result of reduced mortality, improved health and reduced costs of illness, as well as higher productivity.[46] The fact that the benefits extend well beyond the individual household points to a need for significant public investment in sanitation facilities.

53. For low-income countries with low levels of sanitation coverage, meeting the target may require that public spending is focused on basic, low-cost sanitation facilities for those currently without access, leveraging household and community investments. In cities, public investment can concentrate on common infrastructure, such as trunk sewers and treatment plants, promoting education and information on hygiene and sanitation in schools and the media, financing public and school sanitation facilities, and providing targeted subsidies to poor households to finance sewer connections or up-front costs for on-site sanitation.

54. Surveys to assess the willingness of households to pay for sanitation facilities and services can support the development of policies to mobilize the best combination of public and private resources and make most effective use of the public resources available.

55. In rural areas and urban informal settlements where on-site sanitation is the main option, much of the investment, including labour, can come from the households themselves. Those household investments can be promoted and supported by public policies and programmes to facilitate and subsidize access to materials based on standardized designs, technical advice on facility construction and maintenance, provision of hygiene education, support for community organizations promoting improved sanitation, training of local entrepreneurs in construction and maintenance, and access to credit for households and small entrepreneurs.

56. In a number of countries, microcredit programmes, which were originally intended for investments in income-generating activities, have been expanded to include housing improvements such as water supply and sanitation. In other countries, microcredit or other financing programmes dedicated to housing improvement have been established. In urban informal settlements, these programmes are apt to be most effective when accompanied by measures to improve tenure security (see report of the Secretary-General on human settlements (E/CN.17/2005/__)). Seed capital from Governments or international lending agencies can be used to create credit schemes or revolving funds directed at water, sanitation and other household and community improvements, including for lending to small-scale service providers. Mainstream banking institutions can expand access to credit by allowing for non-traditional forms of collateral based on social self-help groups and shared liability.[47]

57. In formal and densely populated urban areas requiring sewerage systems and waste-water treatment, national and municipal governments generally take responsibility for investments and operation and maintenance, financed from some combination of general taxation, charges for water services, loans and international assistance. Investments by municipal governments can be supported by policies to give them authority to raise money by taxation or borrowing, and to facilitate borrowing through municipal development banks or loan guarantees (for further consideration of municipal finance, see report of the Secretary-General on human settlements (E/CN.17/2005/__)).

58. Cost recovery for urban sewerage and waste-water treatment is most commonly achieved by incorporating sewerage charges into the water bill. Such charges can be levied either on a flat charge per household or on the basis of the volume of water consumed, which requires a water meter for each household. With volume-based charges, increasing block rates allows substantial cost recovery from larger users, while ensuring that the services are affordable for low-income households that consume basic amounts of water for drinking, cooking, hygiene and sanitation. Pro-poor policies can, as in South Africa, provide a basic amount of water free to every household, with a simple and inexpensive system for limiting consumption to that volume (see E/CN.17/2005/2).

59. Cost-recovery systems for water and sanitation often include one-time connection charges, which can be a major financial obstacle for poor households. To enable poor households to afford sewer connections, connection costs can be included in water bills, prorated over time or provided on credit, preferably with a targeted subsidy.

60. Public-private partnerships can play a role in financing and developing sanitation infrastructure in some circumstances. Efforts to mobilize large-scale private-sector investment for urban sewerage and waste-water treatment systems in developing countries have been limited, and have mainly occurred in the context of public-private partnerships in large-city water supply systems, with a return on the investment in sanitation derived from sanitation charges added to the water bill. Where the private sector is involved in developing and managing water, sewerage and waste-water treatment services, effective government oversight is required, both to negotiate a contract that meets the requirements of the Government and the public and private providers, and to monitor operations to ensure that the terms of the contract are fulfilled (see also E/CN.17/2005/2).

61. Urban sewer systems often collect waste water not only from households and other municipal sources but also from industry. Industrial pollution can substantially increase the technical difficulty and the cost of waste-water treatment. The burden of waste-water treatment on public finances can be reduced by cost-recovery policies for industry, including volume-based charges and charges for specific effluents, and by requiring and/or assisting industry to reduce pollution, either through cleaner production processes or on-site waste-water treatment.

62. For many developing countries, particularly those in sub-Saharan Africa and other least developed countries, international assistance will be required to meet the 2015 sanitation target. These countries currently receive less assistance per capita than many other developing countries even though they face a greater financial burden in meeting the sanitation challenge. In view of the limited possibilities for financing sanitation investments through cost recovery for sanitation services, financial assistance to these countries for the implementation of their sanitation programmes could be considered in the form of grants.[48]

63. Mainstreaming sanitation concerns in national sustainable development and poverty reduction strategies could help mobilize international assistance for sanitation because those strategies are often used as a basis for defining assistance policies by both multilateral and bilateral agencies, particularly with respect to debt reduction and the enhanced heavily indebted poor countries initiative.

64. Improved donor coordination and harmonization of assistance modalities could improve the quality and effectiveness of assistance, particularly by avoiding fragmentation of efforts with a diversity of technologies, resulting in uneven coverage and difficulties in maintenance. Coordination of international assistance in water and sanitation can be enhanced through UN-Water and regional coordinating mechanisms. Consolidating the dispersed efforts of existing initiatives in water and sanitation, and ensuring the participation of multilateral financing institutions, would improve both the flow and impact of international assistance. Such coordination could be incorporated into plans for the International Decade for Action: Water for Life, 2005-2015.

65. The number of major international water and sanitation initiatives launched following the World Summit on Sustainable Development indicates a renewed interest and commitment by donors to the water and sanitation sector. The rural water supply and sanitation initiative of the African Development Bank has been mentioned above. Also, the African Water Facility has been created to channel loans and grants to implement projects proposed by local utilities, authorities and partnership networks.

VII. Moving ahead: towards a framework for action

66. A range of policy options and possible actions to overcome the constraints and obstacles impeding implementation of the goals and targets contained in Agenda 21 and the Johannesburg Plan of Implementation relating to sanitation have been outlined above. They are by no means exhaustive. Given the variety of circumstances and priorities across countries and even across regions within countries, there is clearly no one-size-fits-all solution. Governments will want to elaborate their own strategies, policies and programmes, learning from each others' experience while also adopting new methods and innovative approaches.

67. **National Governments and local authorities bear principal responsibility for reducing the proportion of their people without access to sanitation and for promoting sanitation and hygiene education. They also shoulder the burden for securing finance for public investments in sanitation and waste-water treatment. Strong political commitment has been identified as central to meeting these responsibilities, which can be demonstrated at the national level in a number of ways. Recognizing sanitation as a national development priority in sustainable development and poverty reduction strategies, supported by adequate budgetary allocations and realistic time frames for targeted policy interventions, are important steps. Providing sanitation with an institutional "home" within government can facilitate strengthened networking among national and local authorities responsible for water, sanitation, health, environment, education and finance. This should result in improved coordination and more focused actions to implement sanitation programmes and projects. Political commitment can also be demonstrated through policy interventions and financial means targeted at the most pressing sanitation problems in rural areas, slums and informal settlements.**

68. **Most developing countries cannot achieve their sanitation goals and targets without the cooperation and support of the international donor community. Donor countries can assist the developing countries by allocating higher portions of official development assistance (ODA) to sanitation programmes, providing a higher proportion of financial assistance in the form of grants and improving donor coordination in implementation efforts. Capacity-building, education and training could be better targeted in such areas as institutional development, tariff and subsidy schemes, waste-water management, regulatory reforms and financial management. The importance of transferring and diffusing low-cost sanitation and waste-water treatment and reuse technologies has been identified.**

69. **Governments have at their disposal a number of policy options to expand access to sanitation in urban and rural areas. At the household and community levels, financial and technical support could be aimed at efforts to implement low-cost sanitation solutions or to subsidize up-front sanitation installation costs for poor families in rural areas, slums and informal settlements. Financial and technical assistance can be made available for sanitation support centres in rural areas that provide hardware and engineering services related to the installation and maintenance of sanitation equipment. Facilitating access for small-scale providers to credit and engaging them in public-private partnerships are important options, as are providing incentives to households for constructing on-site facilities and ensuring active participation of women in the design of sanitation solutions. Technical assistance to rural communities in the design of sanitation facilities, technology transfer and repair services can also be effective. Other policy options include those that target training needs, such as for decision makers and project managers, on evaluating the cost-effectiveness and appropriateness of sanitation options, as well as participatory training on the community-based management of sanitation schemes.**

70. **Sanitation and hygiene programmes are more likely to be successful if people are aware of the health and economic benefits arising from improved sanitation and hygiene. Measures at the national, local and community levels may include providing and maintaining gender-separated sanitation facilities at**

school premises and in public places. Public awareness campaigns on the linkages between sanitation, hygiene and health can be effective in changing behaviour. The inclusion of hygiene education in school curricula can be promoted, as can the work of NGOs that undertake sanitation hygiene education and awareness. The formation of local sanitation clubs can also be encouraged.

71. In the area of waste-water treatment and reuse, every effort is needed to develop and apply low-cost, culturally appropriate solutions. Donor-supported policies and actions at the national and local levels can provide a framework for constructing decentralized or condominial sewerage systems or other low-cost alternatives and enhancing technical and administrative skills for operating and maintaining waste-water treatment facilities. Such a framework could also encourage the use of proven approaches to waste-water collection and reuse for irrigation, environmental restoration, cleaning, toilet flushing, industrial processes and other uses with low health risks. The establishment of research partnerships between research and development institutions of developed and developing countries on low-cost waste-water treatment and reuse technologies could also be encouraged.

72. Meeting the sanitation goals and targets contained in the Johannesburg Plan of Implementation requires financial resources that cannot be mobilized alone from domestic public and private sources, in particular in sub-Saharan Africa and the least developed countries. Additional donor financial resources are needed, as is closer donor coordination. At the national level, financial resources can be mobilized in a number of ways. Reforms to water and sanitation tariff policies so as to permit greater cost recovery while better targeting subsidies to the needs of the poor provides one example. Funds for large investments in urban sewer systems and waste-water treatment plants can be raised from a mix of public revenues, user fees, ODA grants, concessional and commercial loans, bond issues, and, in some instances, private equity investment. Seed capital from national and local development banks and international lending institutions can support the creation and expansion of microcredit schemes and community revolving funds. Household and community investments can be encouraged, for example, by addressing tenure insecurity in informal settlements, facilitating access to and subsidizing materials, and providing technical advice on facility construction and maintenance.

73. Assisting developing countries in the implementation of the sanitation goals and target is an important part of the work of a number of United Nations agencies and other multilateral institutions. Their experience can be an important asset for developing country efforts to mobilize the necessary financial resources; build the capacities of decision makers and managers at the national and local levels; define well targeted sanitation and hygiene education and awareness-raising programmes; and monitor implementation. Greater cooperation and coordination among international agencies would enhance the coherence and effectiveness of initiatives.

74. While the sanitation challenge is daunting, there is reason for optimism. There is an increasing recognition on the part of Governments and the international community of the urgency of meeting the sanitation goals and

targets contained in Agenda 21 and the Johannesburg Plan of Implementation. Many of the solutions are well known to practitioners. Their implementation depends on the translation of the political commitments into action at all levels.

Notes

[1] The members of UN-Water are: FAO, IAEA, IFAD, ISDR, UNCTAD, UNDP, the Department of Economic and Social Affairs of the United Nations Secretariat, ECA, ECE, ECLAC, UNEP, ESCAP, UNESCO, ESCWA, UN-Habitat, UNHCR, UNICEF, UNIDO, UNU, WWAP, World Bank, WHO and WMO.

[2] See WHO/UNICEF/WSSCC, *Global Water Supply and Sanitation Assessment, 2000 Report* (New York, 2004).

[3] See WHO/UNICEF, "Meeting the MDG drinking water and sanitation target: a mid-term assessment of progress" (New York, August 2004).

[4] See Luong, T. V., O. Chanacharnmongkol and T. Thatsanatheb — "Universal sanitation in rural Thailand", *Waterfront*, No. 15.

[5] Ministère de la Prévention, de l'Hygiene Publique et de l'Assainissement; See http://www.gouv.sn/actualites/2004_564.rtf.

[6] M. N. Roy, "Role of local government in promoting sanitation for all: the case of West Bengal, India", Paper presented to the Global WASH Forum, Dakar, Senegal, 29 November-3 December 2004; see www.wsscc.org/dakar and http://ddws.nic.in/.

[7] The water and sanitation programme of the World Bank has started to implement Millennium Development Goals "road maps" to link water and sanitation plans with the Goals; they include a review of where the country is, consultation with stakeholders, implementation strategies and monitoring, and they focus on the poor.

[8] Fifth General Council meeting of the African Ministers Council on Water, 4-6 November 2004, Entebbe, Uganda.

[9] Albert M. Wright, "Toward a strategic sanitation approach: improving the sustainability of urban sanitation in developing countries", UNDP-World Bank water and sanitation programme; see http://www.wsp.org/pdfs/global_ssa.pdf.

[10] CAESB, The Water and Sewerage Company of Brasilia, *Condominial Sewerage Systems for the Federal District of Brazil* (Brasilia, 1998); see http://www.efm.leeds.ac.uk/CIVE/Sewerage/articles/condominial1.pdf.

[11] See Millennium Project Task Force on Water and Sanitation, interim report (2004).

[12] Case study: community toilets operation and finance in Mumbai, India; see www.globenet.org/preceup/.

[13] Water Utility Partnership for Capacity Building Africa, "Better water and sanitation for the urban poor: good practice from sub-Saharan Africa"; see www.wupafrica.org.

[14] Ibid.

[15] Country case studies can be viewed at http://www.ecosanres.org/Country%20Activities.htm.

[16] Some successful schemes have allowed people to repay on a weekly basis, which is more suitable for the poor who live day-to-day. Studies have also shown that the time spent and income lost due to travelling long distances to make repayments have made microcredit less attractive for many slum dwellers. Information on the International Year of Microcredit, 2005 can be found at http://www.yearofmicrocredit.org/.

[17] Emptying pit or septic tanks had been handled exclusively by the sewerage and sanitation department, but private businesses had also been operating without permits before the

commission began authorizing private operators. Following deregulation, eight operators applied for and received permits, indicating that pit-emptying was a profitable venture despite a strongly competitive market.

[18] See WHO/UNICEF, op. cit.

[19] http://www.wsp.org/publications/sa_marketing.pdf.

[20] Plastics, tin, bamboo, gas pipe, and plastic pans and sockets have been used extensively. Some households may want to choose costlier individual options. Wealthier people within villages have even constructed fancy, attached bathrooms and toilets.

[21] http://www.wsp.org/publications/af_bg_zim.pdf.

[22] The Government provides no subsidy of latrine costs, and has enabled the country to increase sanitation coverage from 20 per cent in 1981 to 53 per cent in 2001; see http://www.wsp.org/publications/af_bg_lesotho.pdf.

[23] Makepe, T., "Mantsonyane water supply and sanitation project: an overview of the project goals and objectives, including achievements to date" (Mantsonyane, Lesotho, St. James' Hospital, October 2004).

[24] http://www.ecosanres.org/PDF%20files/Kyoto/Main%20Features%20of%20EcoSan.pdf.

[25] See UNEP document UNEP/GCSS.VIII/INF/4; see http://www.eldis.org/static/DOC14717.htm.

[26] Traditionally, utility planners developed demand projections based on demographic and economic progress indicators. Projected demand for new services was used for project designs based on sewerage and treatment technologies commonly used in cities of Europe and the United States.

[27] Demand for sanitation increased, with 30 per cent of the new latrines in the country being constructed by members of CHCs. Similar groups have now been established in Sierra Leone, indicating that the approach can be replicated. See http://www.wsp.org/publications/af_bg_bf-zm.pdf.

[28] See Millennium Project, interim report of Task Force 7 on Water and Sanitation, February 2004; see http://w w.unmillenniumproject.org/documents/tf7interim.pdf.

[29] See T. Mathew, "New skills, new lives: Kerala's women masons", *Waterlines*, vol. 17, No. 1.

[30] In many parts of the world, it is essential that separate facilities be provided for girls and boys, particularly when girls have begun menstruating. Without separate facilities for girls and boys, many parents simply will not allow their girls to attend school.

[31] All of these examples come from the school sanitation and hygiene education programme supported by UNICEF and its partners. More information is available at http://www2.irc.nl/sshe.

[32] See UNICEF, *Sanitation for All*; see: http://www.unicef.org/wes/sanall.pdf.

[33] WHO, UNDP, WSP, "The PHAST initiative: participatory hygiene and sanitation transformation", a new approach to working with communities (Geneva, 1997).

[34] The school sanitation and hygiene education programme has been extended to more than 70 countries in the past five years; see http://www2.irc.nl/sshe.

[35] The Water Supply and Sanitation Collaborative Council has launched its Water, Sanitation and Hygiene for All campaign in over 70 countries; see www.wsscc.org.

[36] Mexico is building the Mexican Center for Water and Sanitation Training for operating agency personnel; Trinidad and Tobago has begun studies for its treatment plants.

[37] Since the early 1990s, 13 forests have been established, with a total planned area of 2,700 hectares: see UNEP, "Innovative practices: environmental dimensions of water sanitation and human settlements", paper presented at the eighth special session of the Governing Council/ Global Ministerial Environment Forum, Jeju, Republic of Korea, 29-31 March 2004.

[38] See UNEP, loc. cit.

[39] Martin Medina, "Low-tech option for wastewater treatment, water reuse and nutrient recycling", *Biocycle International* (October 2000).

[40] UNEP/GPA, jointly with WHO, UN-Habitat and the Water Supply and Sanitation Collaborative Council, developed 10 keys for local and national action on municipal waste water, as well as associated guidelines and a web-based knowledge base; see www.gpa.unep.org.

[41] Zimmermann, I. and J. Harrison, "Example of an integrated biosystem, incorporating effective microorganisms"; see www.wpi.edu/News/Conf/NEABC/Proceedings/ibozimmsummary.pdf and www.emtech.org.

[42] Information on primary, secondary and tertiary treatment can be found in document UNEP/WHO/UNHABITAT/WSSCC, at www.gpa.unep.org.

[43] The system of regulation adopted by the majority of South American countries is based on the English system of economic regulation, which sets prices to compensate for operation and maintenance costs, as well as for expansion and earnings on invested capital. Where there is not an adequate basis for comparison, regulators set prices by direct negotiation with the companies.

[44] See www.who.int/water_sanitation_health/wsh0404summary/en/; see also www.unep.org/GC/GCSS-VIII/K0470227%20INF4.pdf

[45] See E/CN.17/2004/5.

[46] Guy Hutton and Laurence Haller, *Evaluation of the Costs and Benefits of Water and Sanitation Improvements at the Global Level* (Geneva, 2004); see http://www.who.int/ water_sanitation_ health/wsh0404/en/.

[47] Financial institutions in Asia and Latin America have developed a particularly wide range of products, including consumer financing, housing loans, infrastructure loans (including for water and sanitation) and educational loans; See M. Mehta and K. Virjee, *Financing Small Water Supply and Sanitation Service Providers: Exploring the Microfinance Option in Sub-Saharan Africa* (December 2003).

[48] Naomi Foxwood and Joanne Greene, "Making every drop count: an assessment of donor progress towards the water and sanitation targets" (Tearfund, 2004); see also http://www.tearfund.org/uploads/documents/Makingevery%20dropcount.pdf.